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EXAMINER	
LEUNG, CHRISTINA Y	
ART UNIT	**PAPER NUMBER**
2633	

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/784,972	GERSTEL ET AL.	
	Examiner	Art Unit	
	Christina Y. Leung	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-17 and 30-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *14,16,17,30 and 31* is/are allowed.

6)☒ Claim(s) *13,15 and 32-37* is/are rejected.

7)☒ Claim(s) *34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on 03 October 2005 has been entered.

Comment on Allowable Subject Matter

2. Although claims 34 and 36 have been amended since the previous Office Action and are no longer the claims that had been previously indicated allowable in that Action, Examiner respectfully notes that the indicated allowability of the subject matter in claims 34 and 36 is withdrawn in view of the newly discovered reference to Bergmann (US 6,240,222 B1). Rejections based on the newly cited reference follow.

Claim Objections

3. Claim 34 is objected to because of the following informalities:

Claim 34 recites "the first transmit and receive ports" (see lines 3-4 of page 12 of the amendment filed 03 October 2005). Examiner respectfully suggests that the Applicants change the word "ports" to "interfaces" so that the terminology is consistent throughout the claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claim 34 is rejected under 35 U.S.C. 102(e) as being anticipated by Bergmann (US 6,240,222 B1).

Regarding claim 34, Bergmann discloses an optical node (Figures 5 and 7A-C; column 7, lines 37-67; column 8, lines 1-67; column 9, lines 1-59) comprising:

a first transmit interface (including input port 212b of circulator 212) to transmit one or more of a plurality of wavelengths;

a first receive interface (output port 212a of circulator 212) to receive one or more of a plurality of optical wavelengths;

a loopback mechanism (including alternate means 221 in transition device 216) comprising a 2x2 optical switch 280 (alternate means 221, including switch 280, is shown in detail in Figures 7A-C);

a second transmit interface (the optical path leading to the input of receiver 290 in alternate means 221 and connected to output port 221a) to transmit one or more of a plurality of optical wavelengths;

a second receive interface (the optical path leading from the output of transmitter 292 in alternate means 221 and connected to input port 221b) to receive one or more of a plurality of optical wavelengths; and

a multiplexer/demultiplexer 214 connected between the first transmit and receive interfaces and the 2x2 optical switch,

wherein the loopback mechanism is operable to perform at least one of looping back one or more of the plurality of optical wavelengths received at the second receive interface to the second transmit interface and looping back one or more of the plurality of optical wavelengths received at the first receive interface to the first transmit interface, each looping back being performed without converting the one or more of the plurality of optical wavelengths to electrical form. Figure 7B shows how the wavelengths at second receive interface (the path connected to port 221b) are looped back to second transmit interface (the path connected to port 221a), while wavelengths received by first receive interface 212a are looped back to be eventually output from first transmit interface 212a (column 9, lines 10-59).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bergmann.

Regarding claim 36, as similarly discussed above with regard to claim 34, Bergmann discloses an optical node (Figures 5 and 7A-C; column 7, lines 37-67; column 8, lines 1-67; column 9, lines 1-59) comprising:

a first transmit interface (the optical path leading to the input of receiver 290 in alternate means 221 and connected to output port 221a) to transmit one or more of a plurality of optical wavelengths;

a first receive interface (the optical path leading from the output of transmitter 292 in alternate means 221 and connected to input port 221b) to receive one or more of a plurality of optical wavelengths;

at least one line side communication interface (including input port 212b and output port 212a of circulator 212);

a loopback mechanism (including alternate means 221 in transition device 216) operable to perform looping back one or more of the plurality of optical wavelengths received at the first receive interface to the first transmit interface, the looping back being performed without converting the optical wavelengths to electrical form

wherein the loopback mechanism comprises a first 2x2 optical switch 280 (in alternate means 221) having a first input port 280d connected to the first receive interface, a second input port 280a connected to the line side communication interface, a first output port 280c connected to the line side communication interface, and a second output port 280b connected to the first transmit interface, and

wherein the optical node further comprises at least one multiplexer/demultiplexer 214 interposed between and connected to the at least one line side communication interface and the first optical switch.

Further regarding claim 36, Bergman discloses that the system further comprises

a second transmit interface (the optical path leading to another receiver, such as receiver 240 in transceiver 227 as shown in detail in Figure 6) to transmit one or more of a plurality of optical wavelengths; and

a second receive interface (the optical leading from another transmitter, such as transmitter 242 in transceiver 227 as shown in detail in Figure 6) to receive one or more of a plurality of optical wavelengths.

Bergmann only shows one alternate means 221 having one 2x2 switch in Figure 5, and does not explicitly disclose a second 2x2 switch connected to the second interfaces. However, Bergmann discloses that various wavelengths in the system may be looped back from the line side communication interface may be looped back with mirror 222 as shown in Figure 5 or connected to the interfaces of transceivers such as transceiver 227 (or the plurality of transceivers shown in Figures 1 and 13).

Since Bergmann disclose using an alternate means 221 with a 2x2 switch for the purpose of selecting between looping back or connecting to a transceiver interface as discussed above, it would have been obvious to a person of ordinary skill in the art to incorporate an additional 2x2 optical switch at another interface in the system disclosed by Bergmann to provide this selection for an additional wavelength. One in the art would have been particularly motivated to provide additional 2x2 switches and increase the flexibility of the structure since the system disclosed by Bergmann is already directed to providing flexible switched connections between wavelengths as desired.

9. Claims 13, 15, 32, 33, and 35-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson (US 6,249,510 B1) in view of Blair et al. (US 6,141,125 A).

Regarding claim 13, Thompson discloses an optical node 100-i interconnected in an optical communication system having the optical node and plural other optical nodes (Figures 1 and 2), the optical node comprising:

at least one interface (such as input port 22 and output port 12) to receive one or more of a plurality of optical wavelengths, from one of the other nodes, and to transmit one or more of the plurality of optical wavelengths;

a loopback mechanism (including switches 30-1 and 35-1 in one of the channel switches 50-1...N) operable to perform looping back of the one or more of the plurality of optical wavelengths received at the at least one interface, back towards the at least one interface without converting the optical wavelengths to electrical form (see loopback path 31-3 shown in Figure 2); and

a multiplexer/demultiplexer (multiplexer 25-1 and demultiplexer 15-2) interposed between the loopback mechanism and the at least one interface,

wherein the one or more of the plurality of optical wavelengths are applied through the multiplexer/demultiplexer after being received at the at least one interface and after being looped back by the loopback mechanism (column 3, lines 35-57).

Thompson discloses that the looping back function may be used for "routing maintenance purposes" in addition to providing a protection path, but does not specifically disclose receiving, transmitting, or looping back a test optical wavelength. However, Blair et al. teach an optical communication system, related to the one disclosed by Thompson, including a plurality of interconnected nodes (Figure 1). Blair et al. also teach that the nodes in such a system may

transmit and receive a test signal, on its own test signal wavelength separate from other wavelengths containing data (column 1, lines 30-44; column 2, lines 49-61).

Regarding claim 13, it would have been obvious to a person of ordinary skill in the art to include a test signal wavelength as suggested by Blair et al. among the plurality of optical wavelengths in the system already disclosed by Thompson in order to monitor the status of the nodes and paths in the optical communication system and ensure that the system is functioning as desired. One in the art would have been particularly motivated to include a test signal wavelength as taught by Blair et al. so that faults in the network operation can be readily detected.

Regarding claim 32, Thompson further discloses:

at least one further interface (input port 11 and output port 21) to transmit one or more of a plurality of optical wavelengths and receive one or more of a plurality of optical wavelengths,

wherein the loopback mechanism also is operable to loop back one or more of the plurality of optical wavelengths received at the further interface back towards the further interface without converting the optical wavelengths to electrical form (using switches 35-2 and 30-2 in one of the channel switches 50-1...N; see loopback path 32-3 shown in Figure 2).

Regarding claims 33, 35, and 37, Thompson does not specifically disclose a 2x2 optical switch. However, Thompson already discloses providing the switchable connections between inputs and outputs that are specifically recited in the claim using a plurality of 1x3 and 3x1 switch elements, and only lacks specifically using a 2x2 switch element to make the connections. It is well understood in the art that various connections between a plurality of inputs and outputs may be created by a variety of equivalent switch topologies incorporating various switch

modules. It would have been obvious to a person of ordinary skill in the art to provide the already-disclosed switchable connections in the system described by Thompson in view of Blair et al. using an implementation including 2x2 switches as an engineering design choice of a way to implement a switching topology using available parts. The claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

Regarding claim 15, Thompson discloses an optical network (Figures 1 and 2) comprising:

n, where n is a integer, optical nodes 100-i, including a source node to provide an optical signal, and a loopback node to loop back the optical signal towards the source node; and

optical fibers 110 and 120 optically connecting the n nodes, and to carry the optical signal between the source node and the loopback node via intermediate nodes,

wherein the loopback node (for example, node 100-i shown in Figure 2) comprises

at least one receive interface (such as input port 22) coupled to at least one optical fiber connected to the loopback node,

at least one transmit interface (such as output port 12) coupled to at least on optical fiber connected to the loopback node,

an optical loopback circuit (including switches 30-1 and 35-1 in one of the channel switches 50-1...N), coupled to the at least one transmit interface 12 and the at least one receive interface 22, to perform looping back of the optical signal including the test optical signal towards the source node without converting the optical signal including the test optical signal to an electrical signal (see loopback path 31-3), and

at least one multiplexer/demultiplexer (multiplexer 25-1 and demultiplexer 15-2) interposed between the optical loop-back circuit and each of the at least one receive interface and the at least one transmit interface (column 3, lines 35-57).

Again, Thompson discloses that the looping back function may be used for "routing maintenance purposes" in addition to providing a protection path, but does not specifically disclose receiving, transmitting, or looping back a test optical wavelength. However, Blair et al. teach an optical communication system, related to the one disclosed by Thompson, including a plurality of interconnected nodes (Figure 1). Blair et al. also teach that the nodes in such a system may transmit and receive a test signal, on its own test signal wavelength separate from other wavelengths containing data (column 1, lines 30-44; column 2, lines 49-61).

Regarding claim 15, it would have been obvious to a person of ordinary skill in the art to include a test signal wavelength as suggested by Blair et al. among the plurality of optical wavelengths in the system already disclosed by Thompson in order to monitor the status of the nodes and paths in the optical communication system and ensure that the system is functioning as desired. One in the art would have been particularly motivated to include a test signal wavelength as taught by Blair et al. so that faults in the network operation can be readily detected.

Regarding claim 38, Thompson further discloses that the optical loopback circuit comprises at least a first optical switch 30-1 having a first input port connected to receive at least one of the optical wavelengths received at the at least one receive interface 22, the optical switch being adapted to output the received optical wavelengths from a first output port to the at least one transmit interface 12.

Regarding claim 39, Thompson further discloses that wherein the loopback node further comprises:

at least one further receive interface (input port 11); and

at least one further transmit interface (output port 21),

wherein the optical loopback circuit further comprises a second optical switch 30-2 having a first input port connected to receive at least one of optical wavelengths received at the at least one further receive interface 11, the second optical switch being adapted to output the received optical wavelength from a first output port to the at least one further transmit interface 21.

Regarding both claims 38 and 39, Thompson does not specifically disclose 2x2 optical switches for providing the switchable connections. However, again, it is well understood in the art that various connections between a plurality of inputs and outputs may be created by a variety of equivalent switch topologies incorporating various switch modules. It would have been obvious to a person of ordinary skill in the art to provide the already-disclosed switchable connections in the system described by Thompson in view of Blair et al. using an implementation including 2x2 switches as an engineering design choice of a way to implement a switching topology using available parts. The claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art

Allowable Subject Matter

10. Claims 14, 16, 17, 30, and 31 are allowed.

11. The following is a statement of reasons for the indication of allowable subject matter:

12. The prior art, including Bergmann, Thompson, and Blair et al., do not specifically disclose or fairly suggest an optical node or optical line terminal with all the limitations and elements (including interfaces, switches, multiplexer/demultiplexer elements, and transponders) connected in the combinations specifically recited in claims 14, 16, 17, 30, and 31, particularly wherein the structures include at least one transponder connected to the switches, interfaces, and multiplexer/demultiplexer elements in the manner recited in the claims.

Response to Arguments

13. Applicants' arguments filed 03 October 2005 with respect to claims 13 and 15 in particular have been considered but are moot in view of the new ground(s) of rejection. Also, again, Examiner respectfully notes that the indicated allowability of the subject matter in claims 34 and 36 is withdrawn in view of the newly discovered reference to Bergmann (US 6,240,222 B1).

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christina Y Leung

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